Triggers encore

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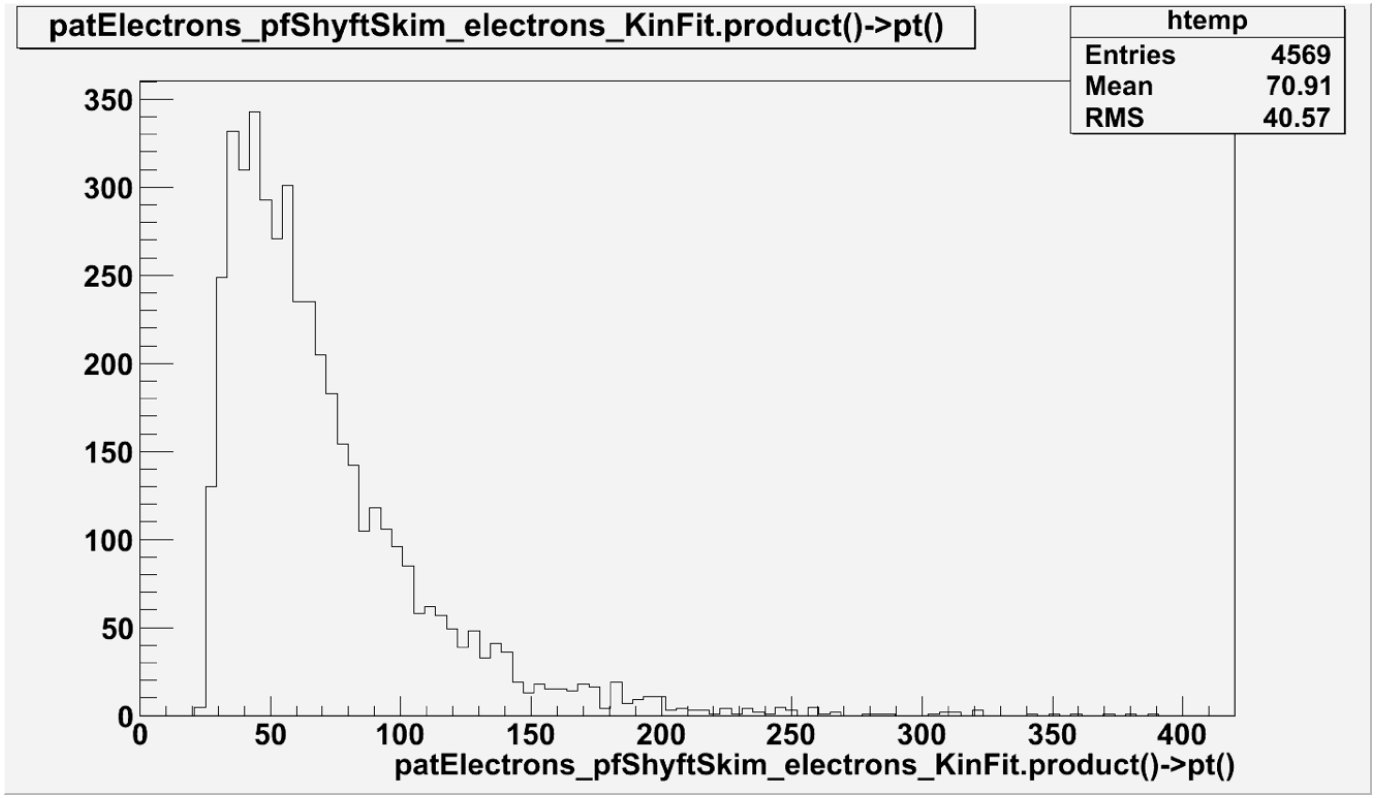
on behalf of the electron+jets group
August 31, 2011

Continued...

- I tried lowering the electron pT at reconstruction, to see if we can explore lower electron pT regions also
- Last week we saw how the Ele15_HT200 trigger compared to Ele32
- This week I did something similar with Ele15_HT250 and Ele25_TriCentralJet30

electron Pt



I lowered the electron pT to 20 GeV for the preselection (the SHyFT top selection) but there is very little data to explore in this lower pt region. Maybe min electron pT of 35 is or 30 GeV is still out best bet

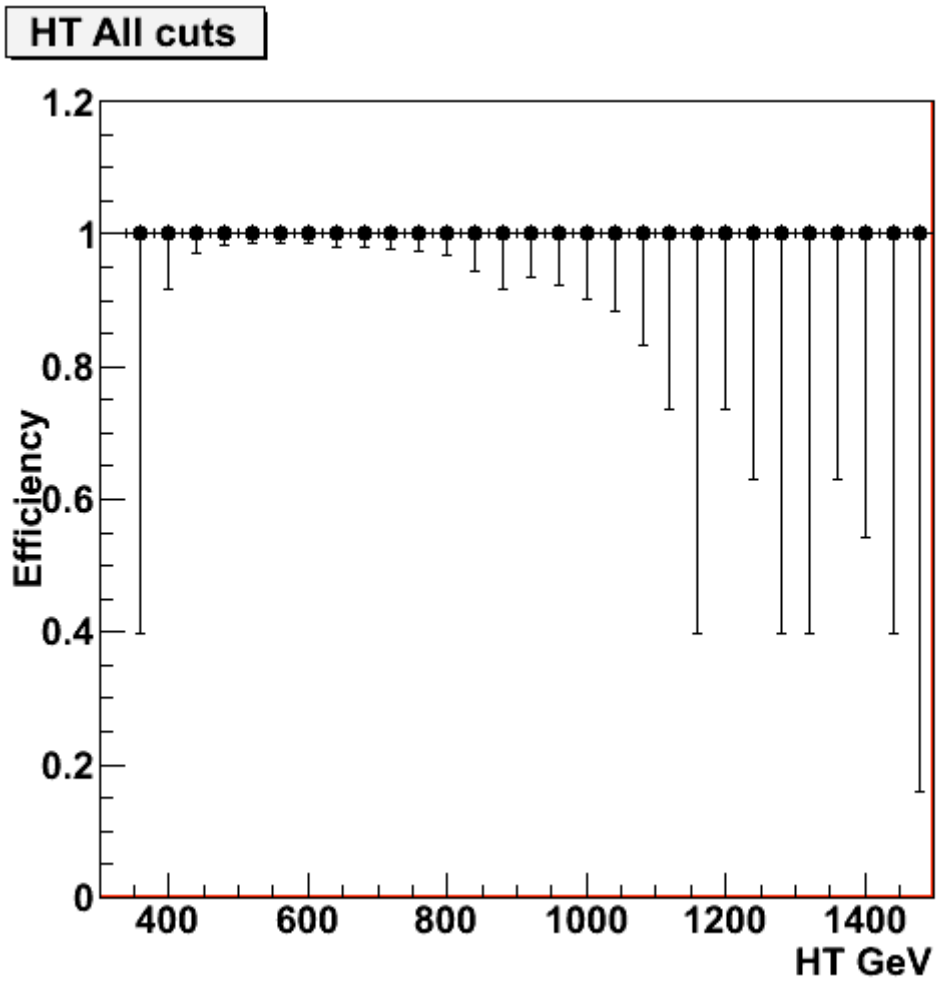
N-1

- In the following plots all selection criteria is applied except the variable plotted
- Reminder
  - electron PT > 35 GeV
  - MET > 20.0 GeV
  - nJets >= 4
  - jet1 pt > 120.0
  - jet2 pt > 90.
  - jet3 and jet 4 pt > 35.0
  - nBTags >= 1

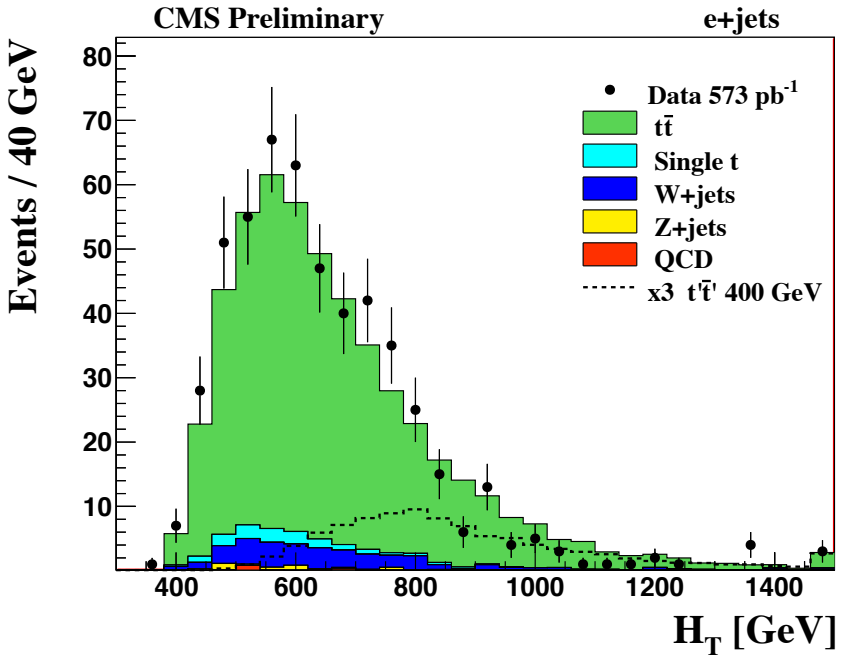
Ele15_HT250 - efficiency

$$\varepsilon = \frac{\text{Denominator} + \text{HLT\_Ele15\_CaloIdT\_CaloIsoVL\_TrkIdT\_TrkIsoVL\_HT250\_v*}}{\text{HLT\_Ele32\_CaloIdVT\_CaloIsoT\_TrkIdT\_TrkIsoT\_v*} + \text{Selection}}$$

HT

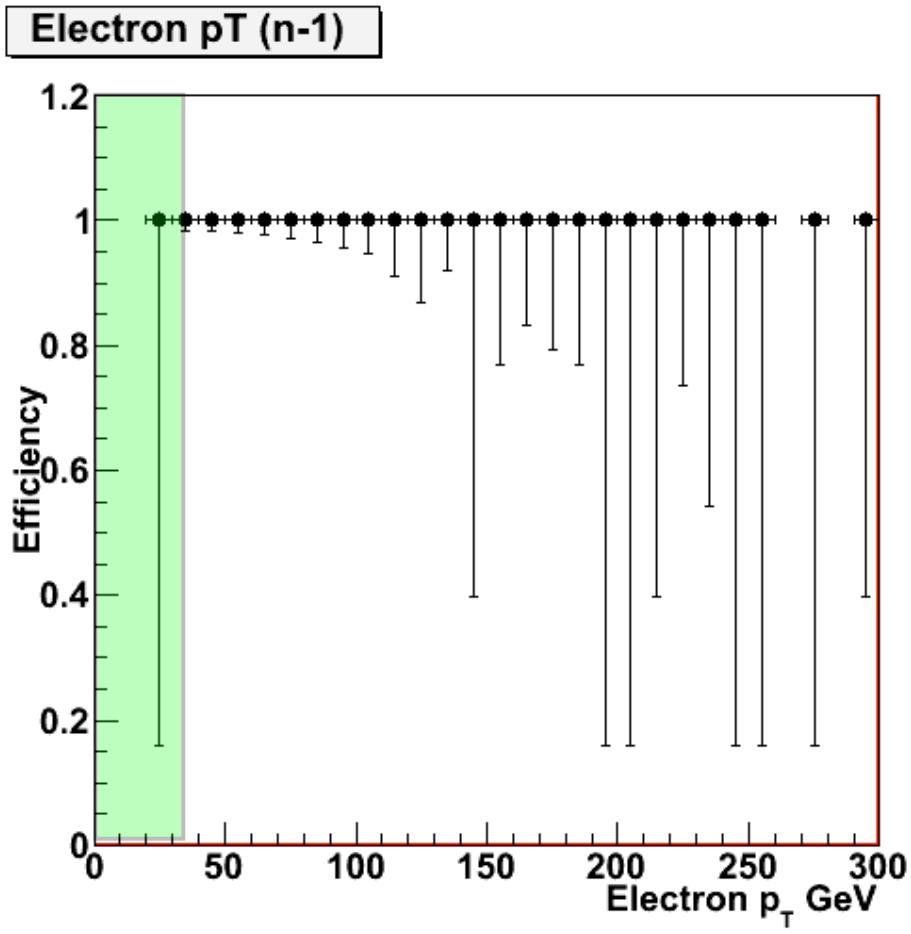


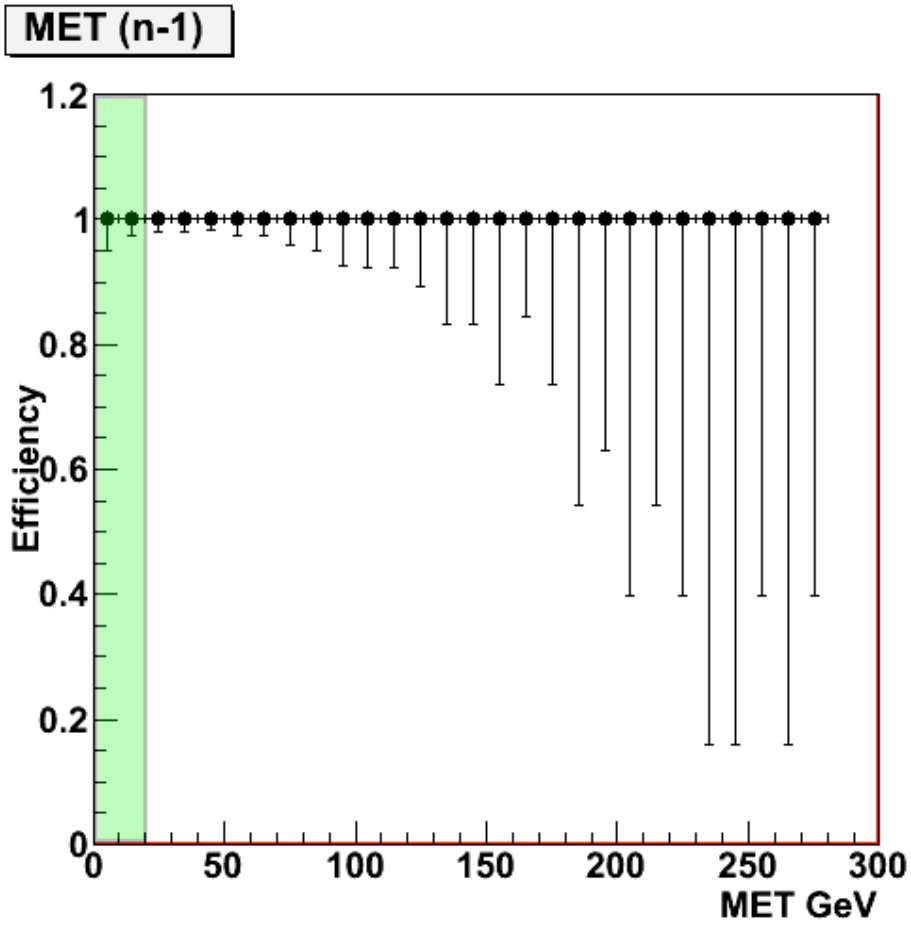
I think it looks pretty safe



Ele15_HT250

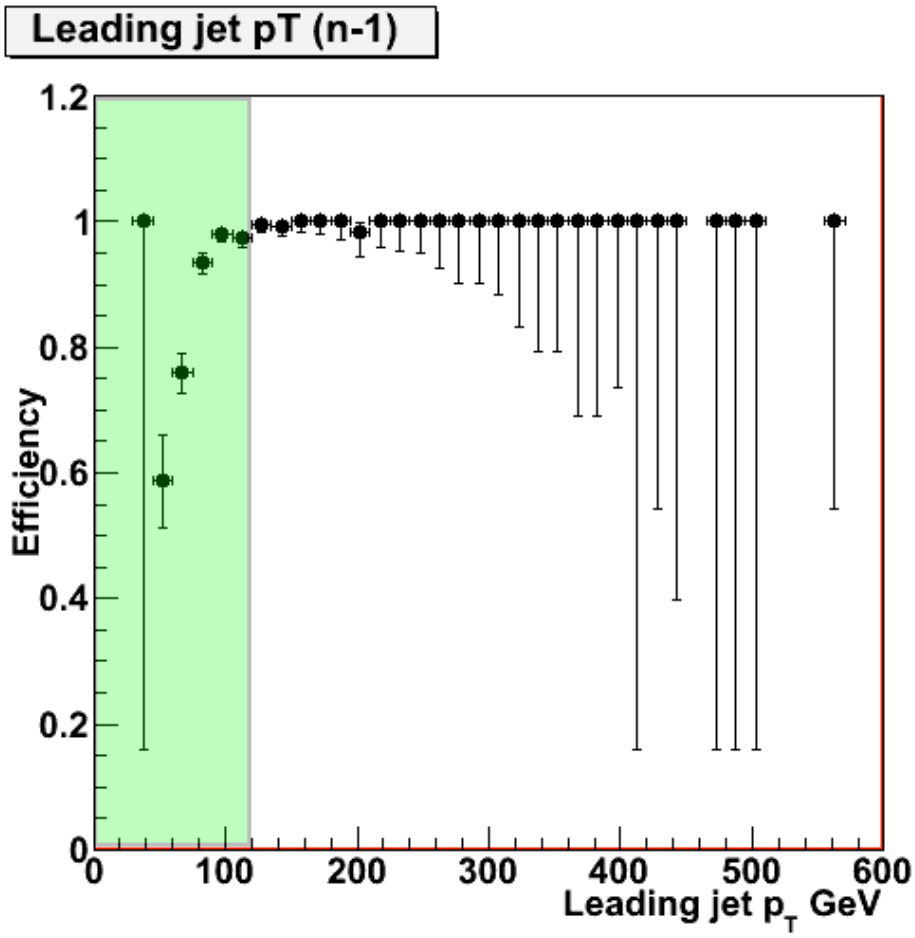
Ele15_HT250

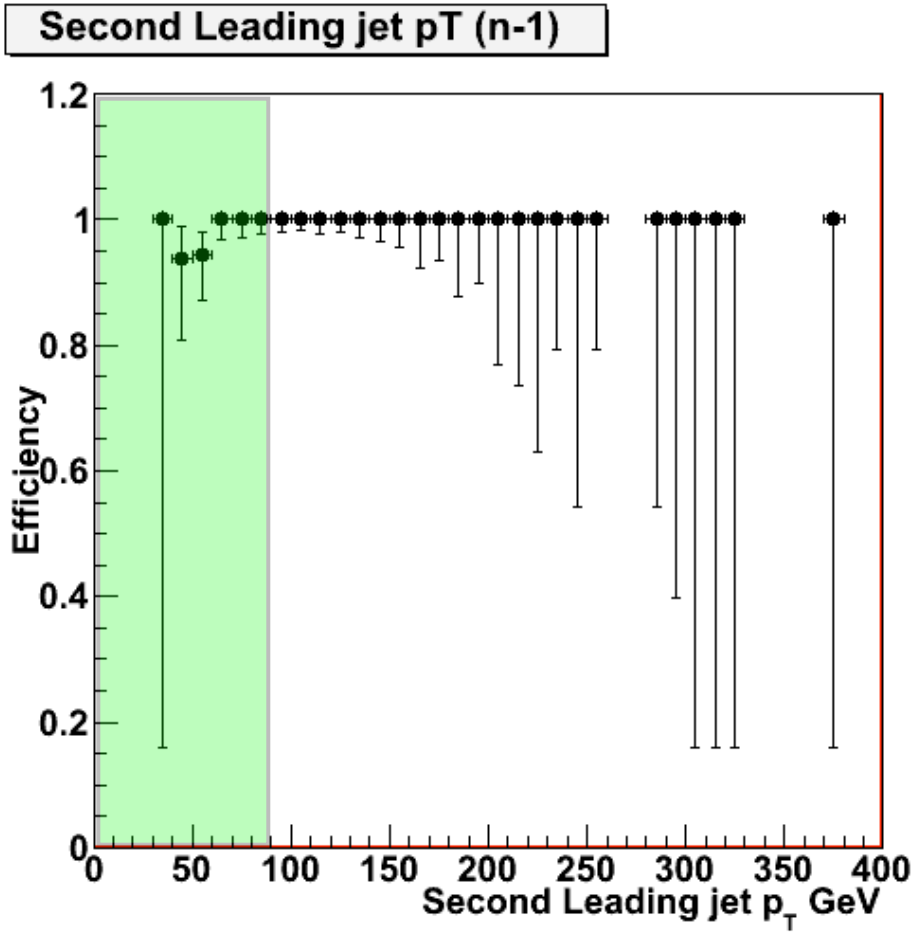




Excluded by our selection

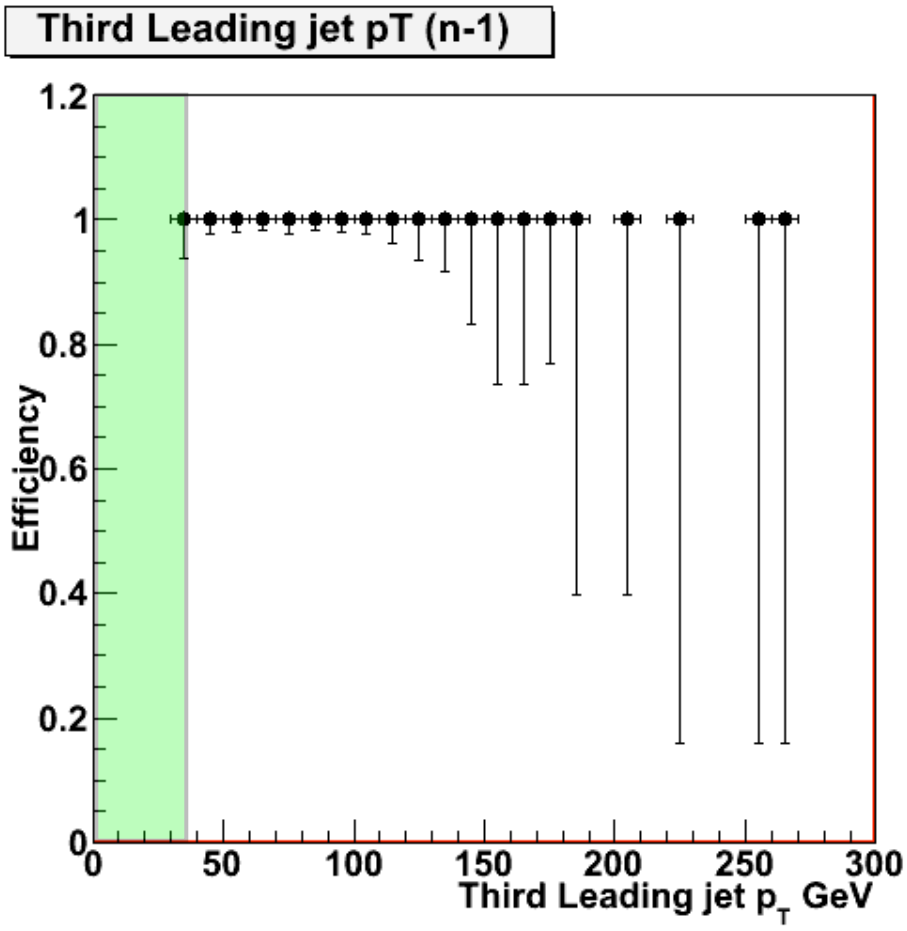
Ele15_HT250

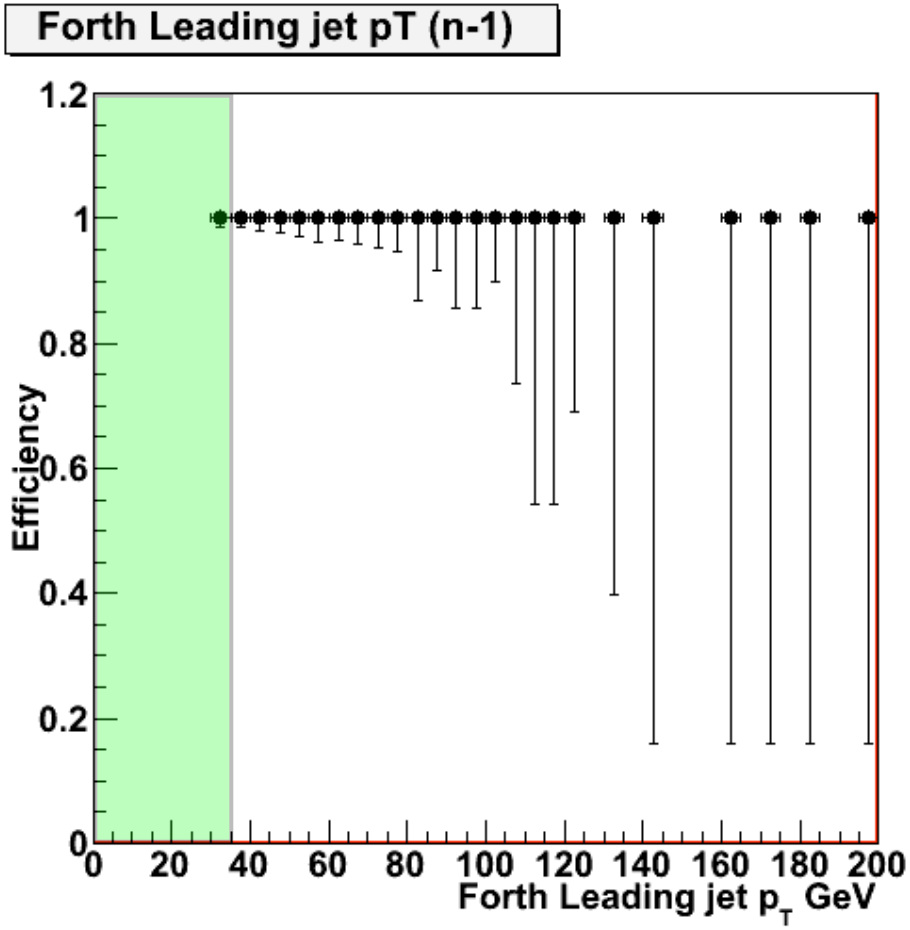




Excluded by our selection

Ele15_HT250



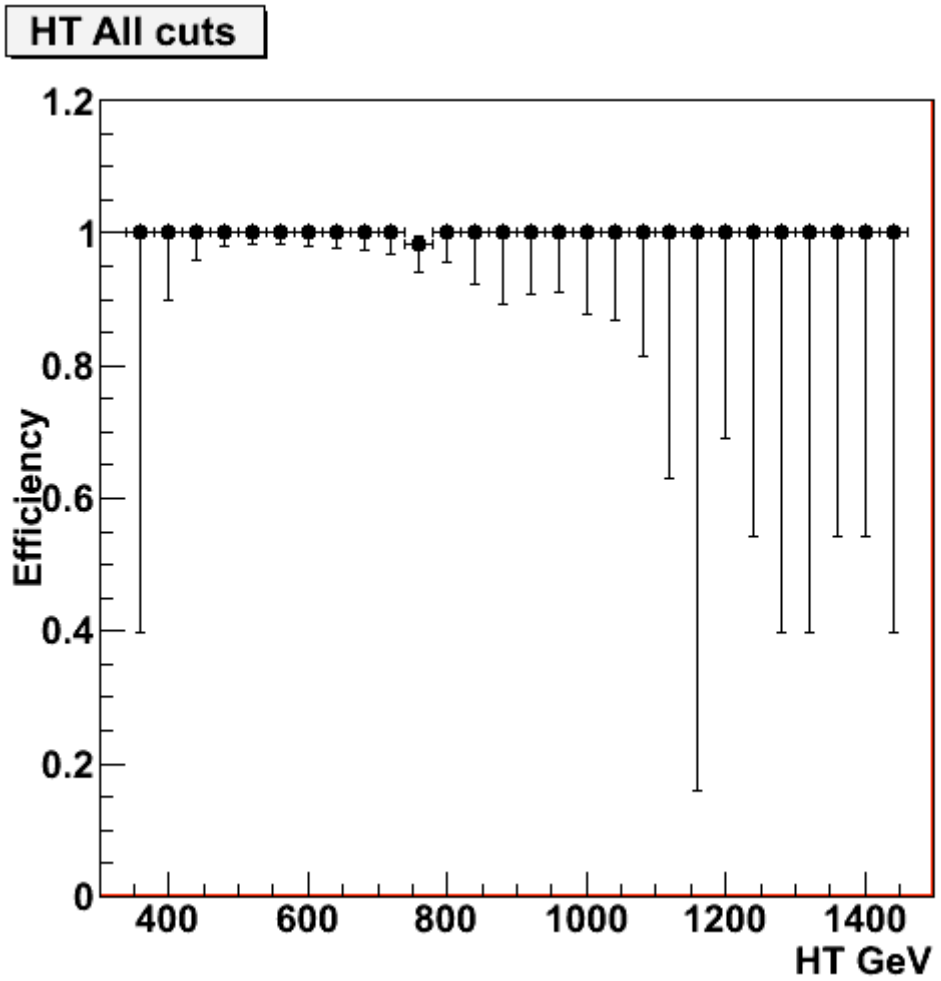


Excluded by our selection

Ele25_TriCentral30 efficiency

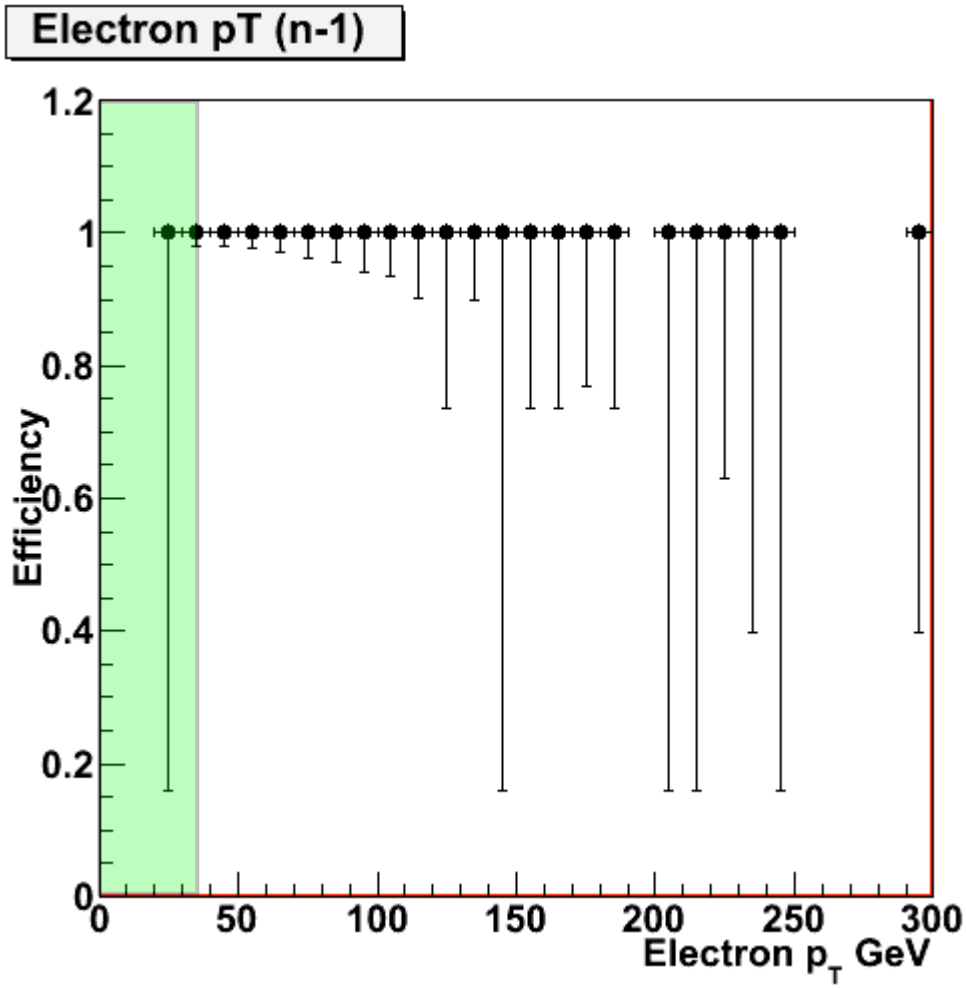
$$\varepsilon = \frac{\text{Denominator} + \text{HLT\_Ele25\_CaloIdVT\_CaloIsoT\_TrkIdT\_TrkIsoT\_TriCentralJet30\_v*}}{\text{HLT\_Ele32\_CaloIdVT\_CaloIsoT\_TrkIdT\_TrkIsoT\_v*} + \text{Selection}}$$

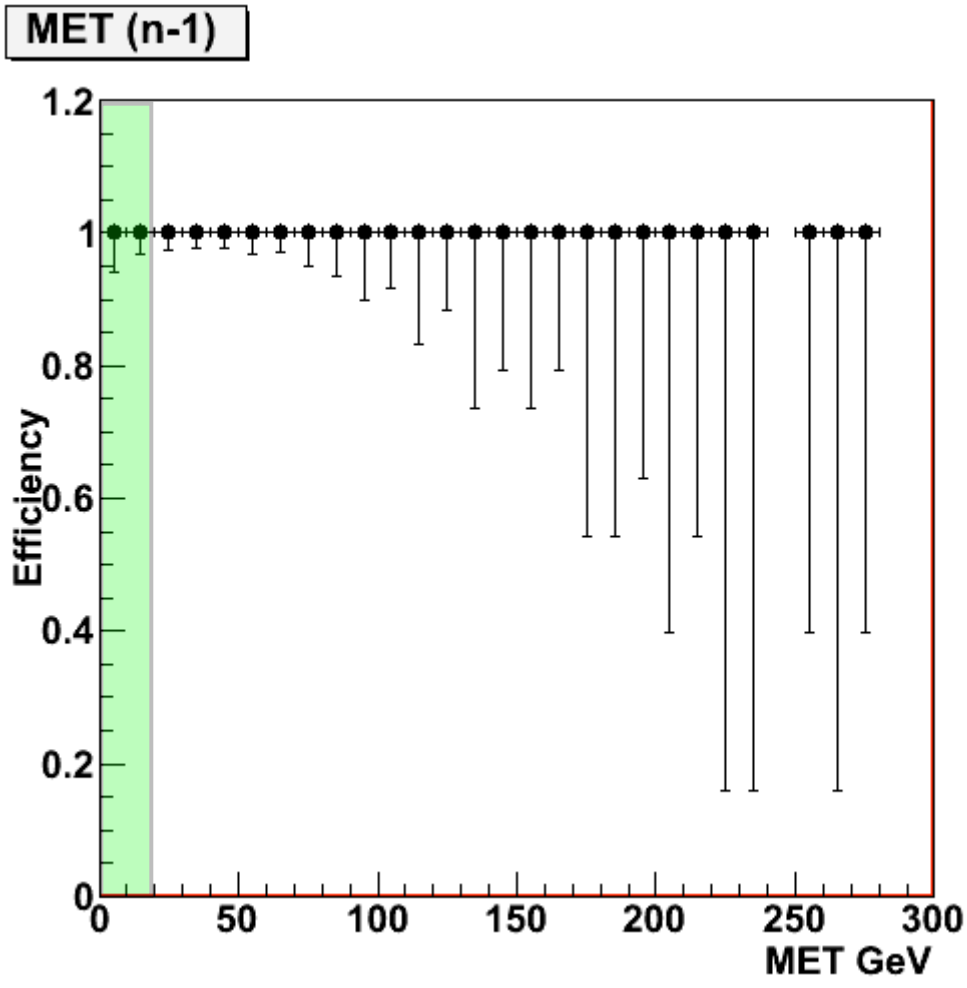
HT



Pretty much 100% efficient

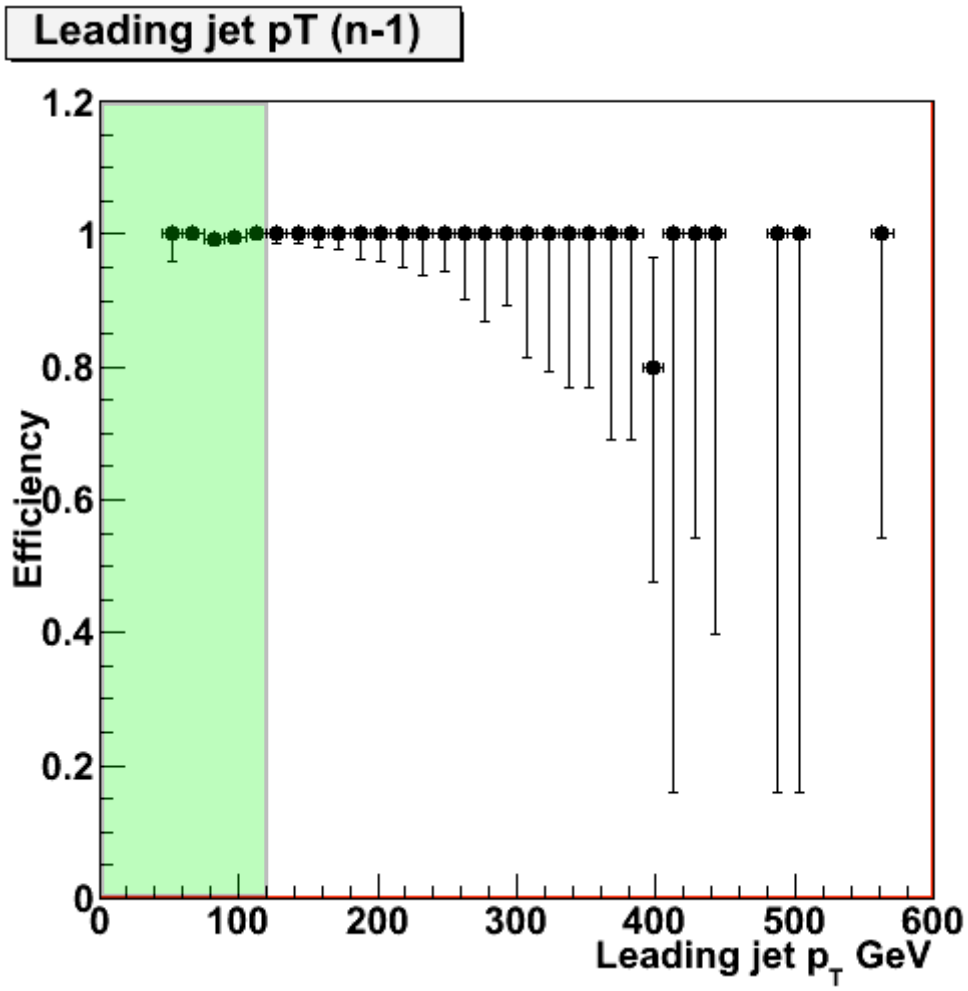
Ele25_TriCentral30

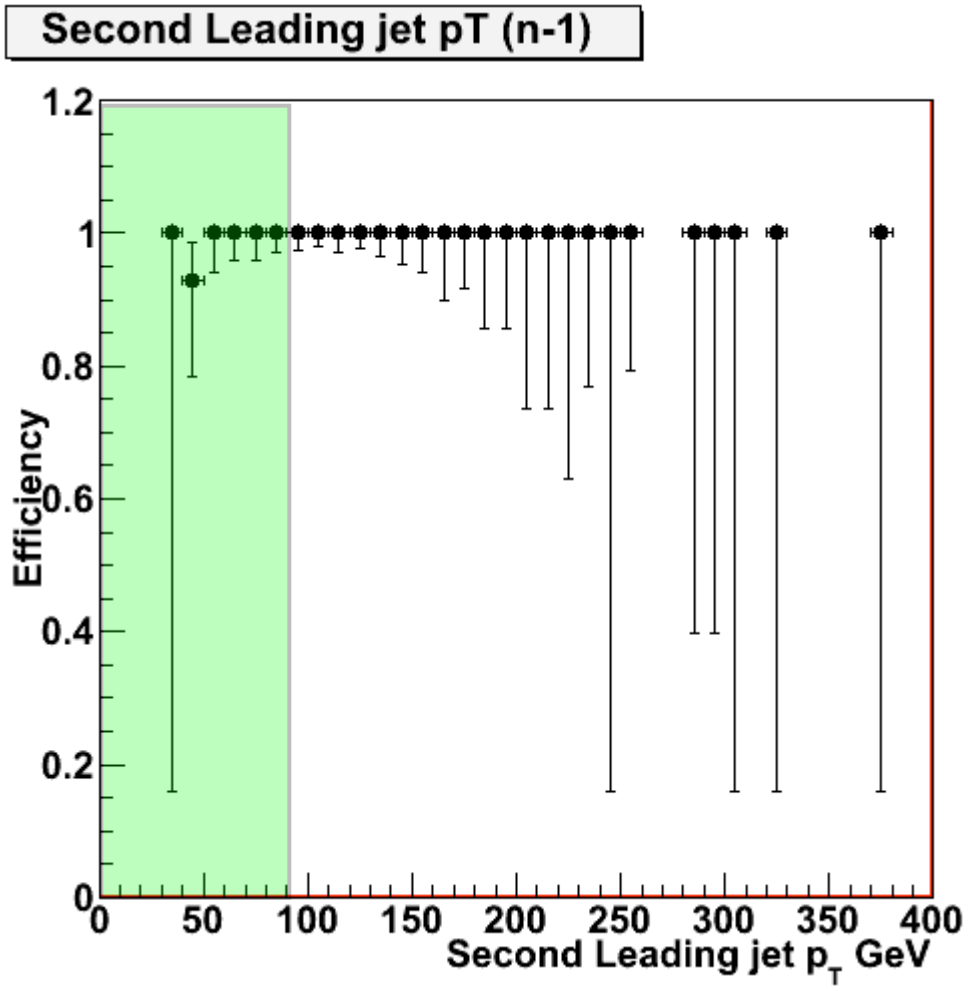




Excluded by our selection

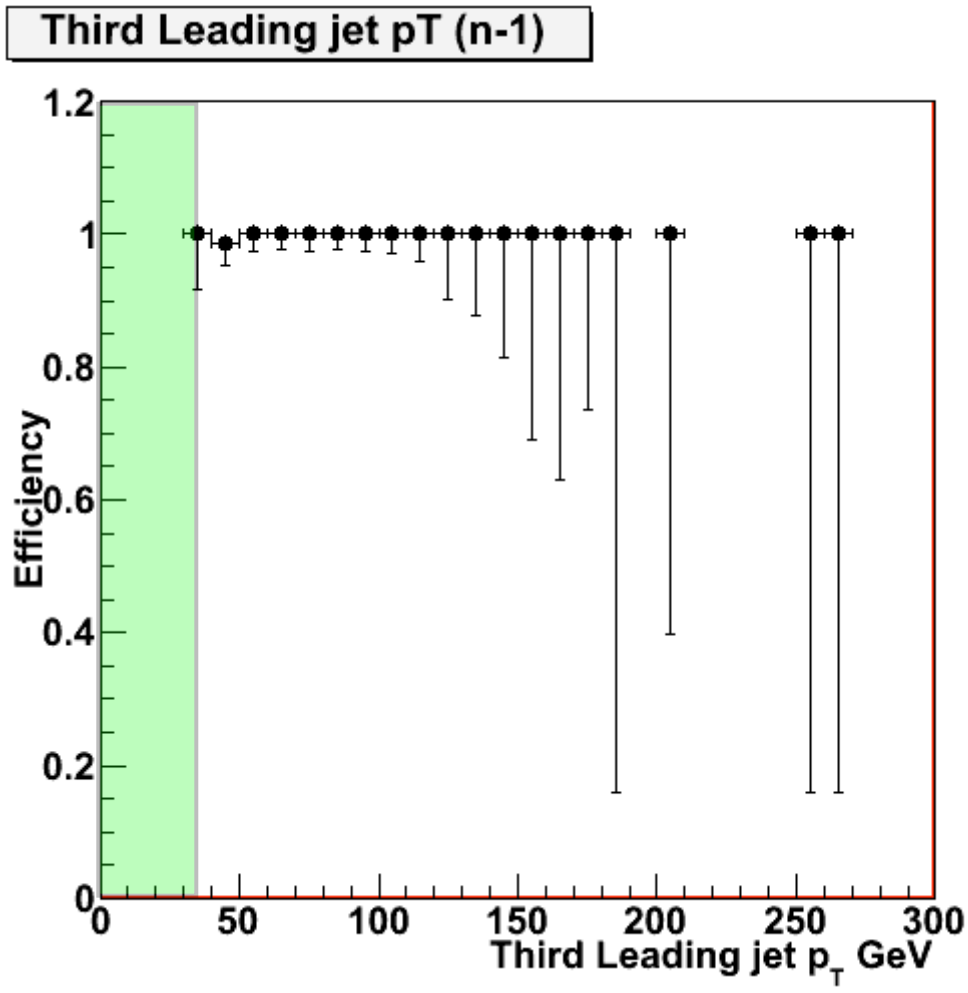
Ele25_TriCentral30

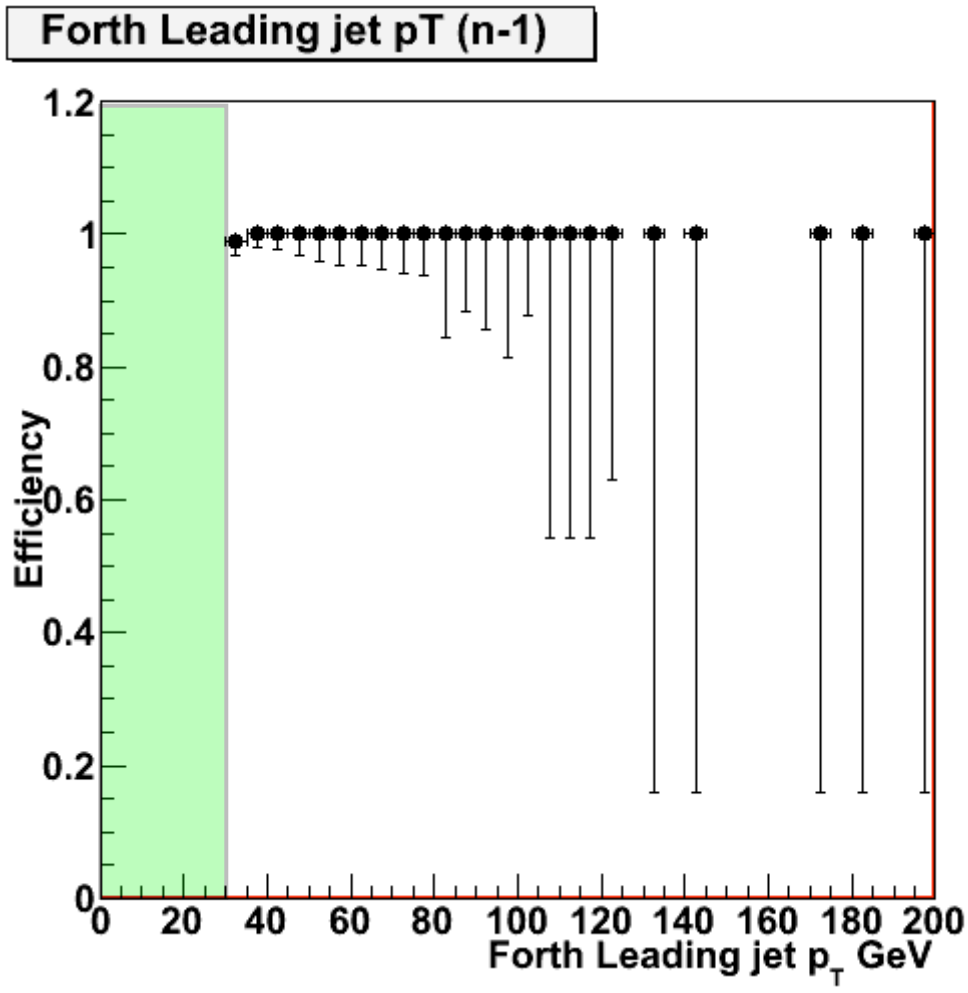




Excluded by our selection

Ele25_TriCentral30





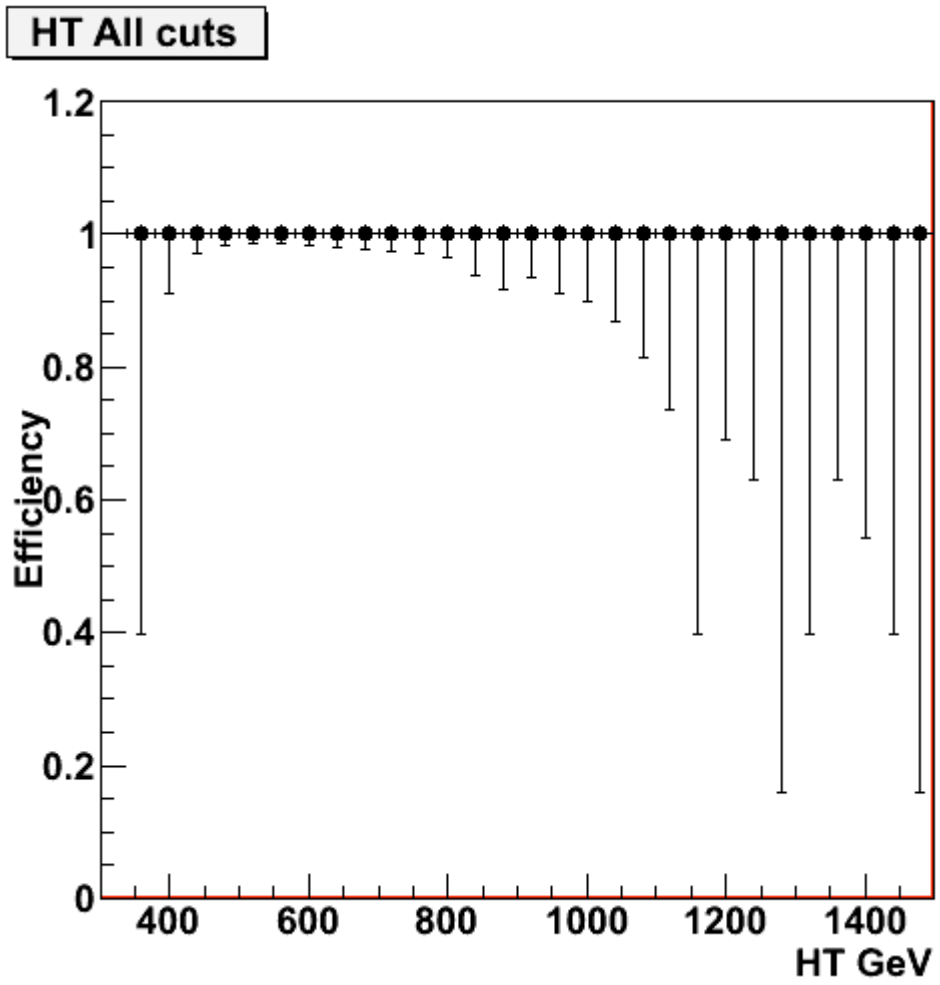
Excluded by our selection

Ele15_HT200 - efficiency

$$\varepsilon = \frac{\text{Denominator} + \text{HLT\_Ele15\_CaloIdT\_CaloIsoVL\_TrkIdT\_TrkIsoVL\_HT200\_v*}}{\text{HLT\_Ele32\_CaloIdVT\_CaloIsoT\_TrkIdT\_TrkIsoT\_v*} + \text{Selection}}$$

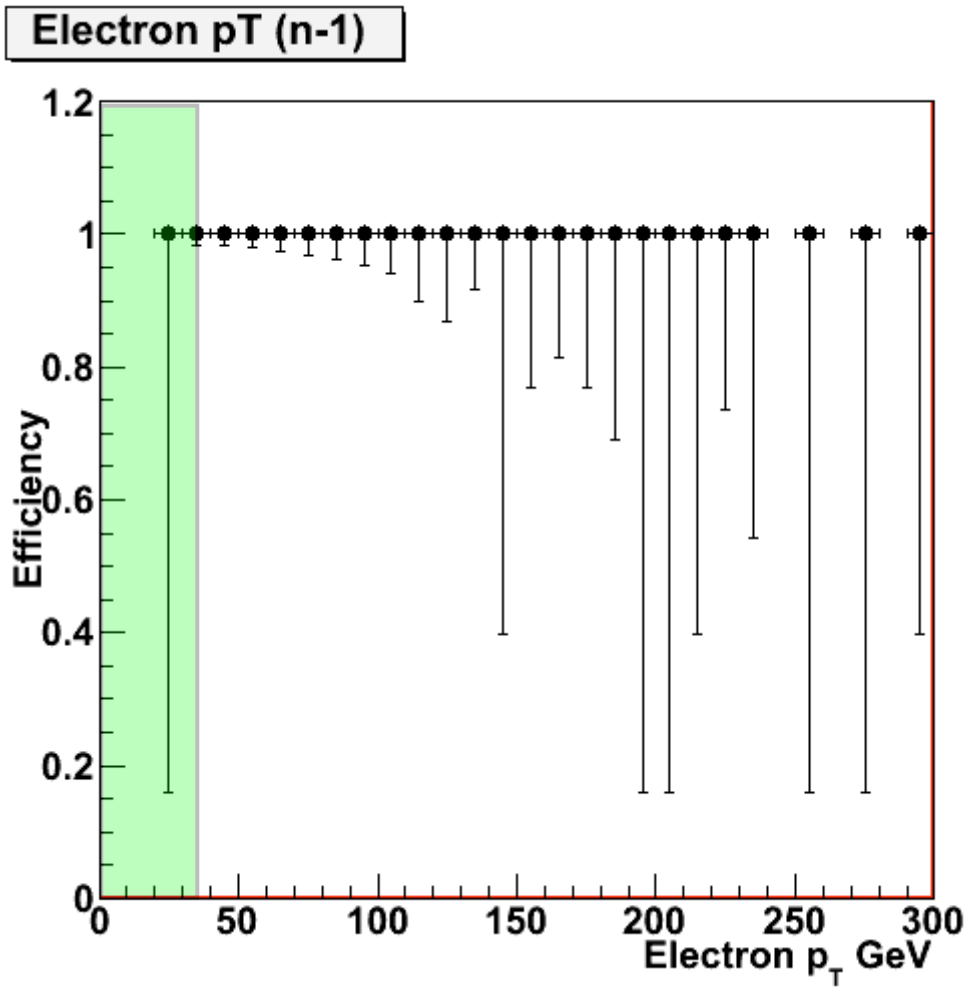
Reminder, now with the lower electron pT

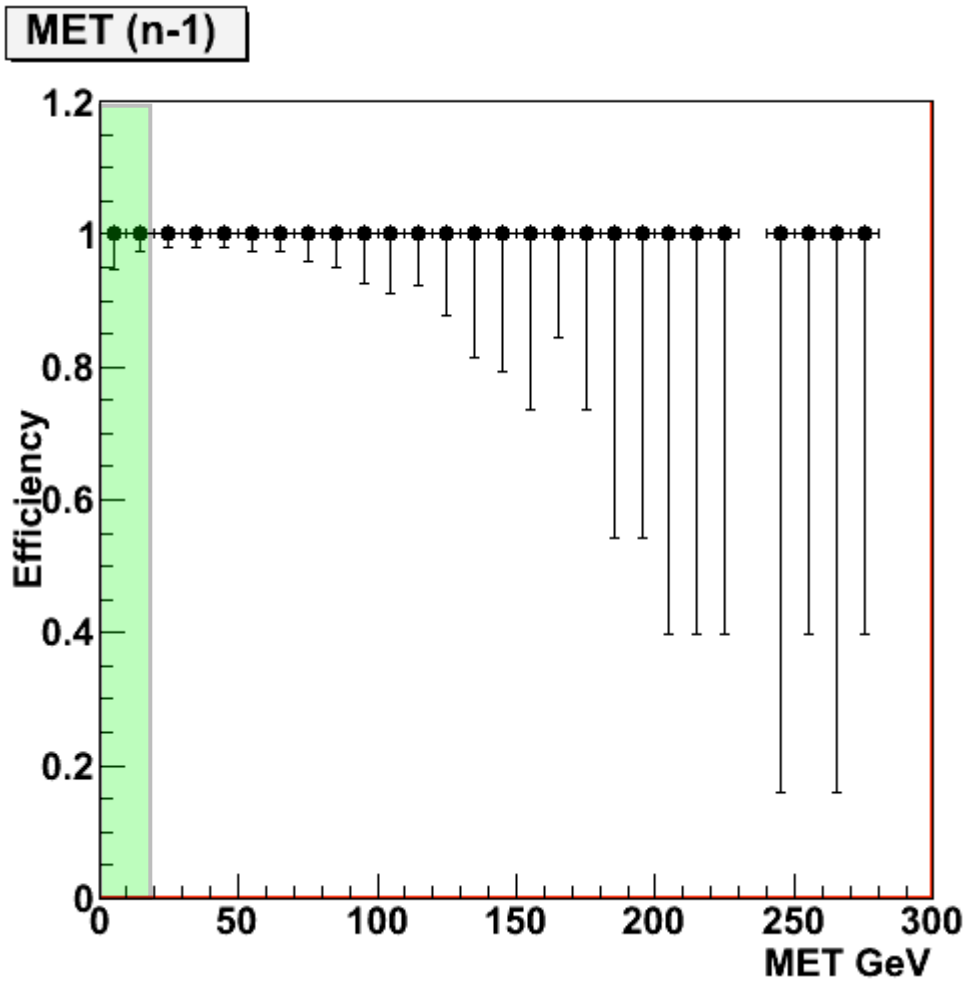
HT



Pretty much 100% efficient

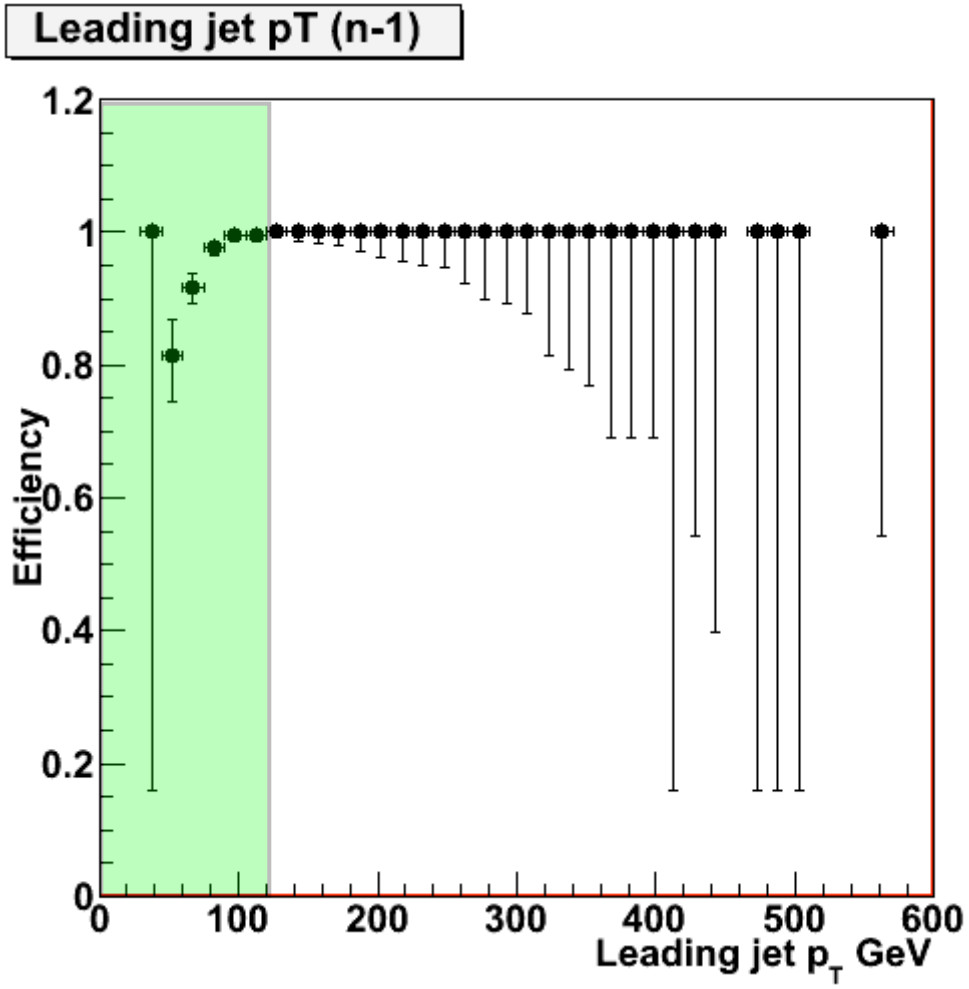
Ele15_HT200

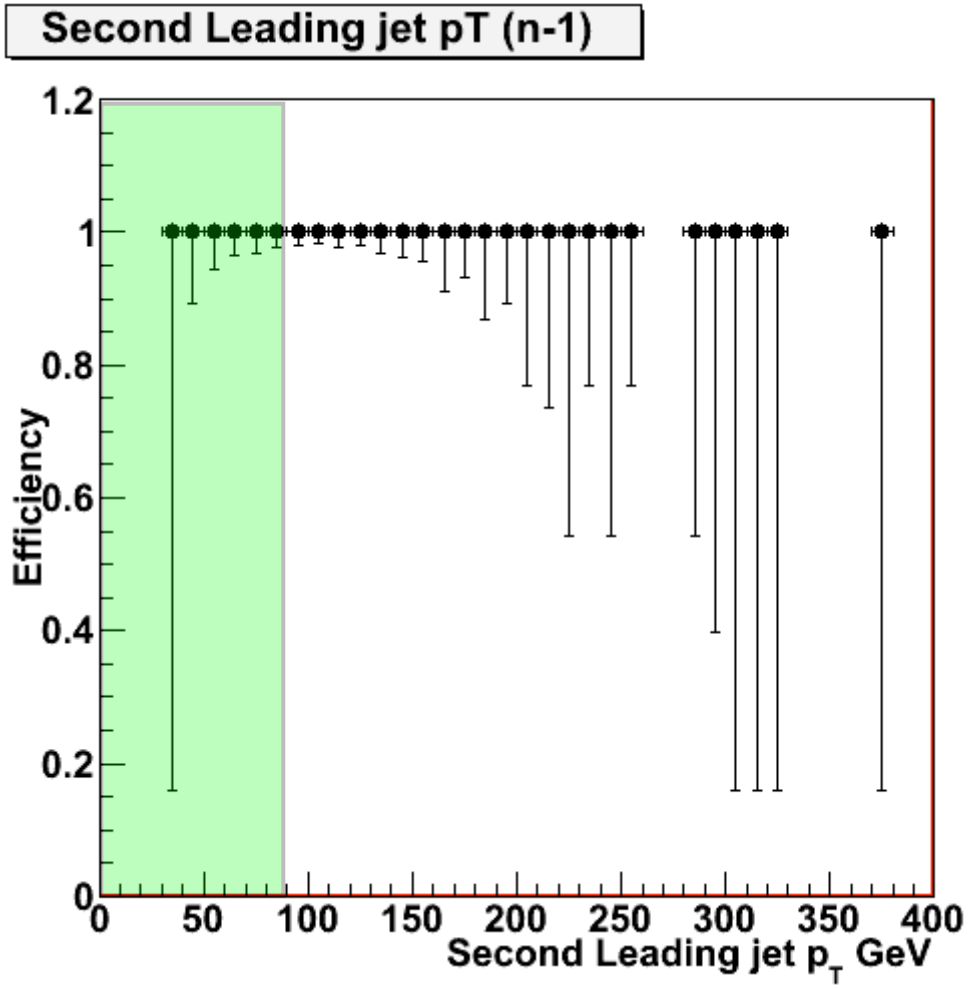




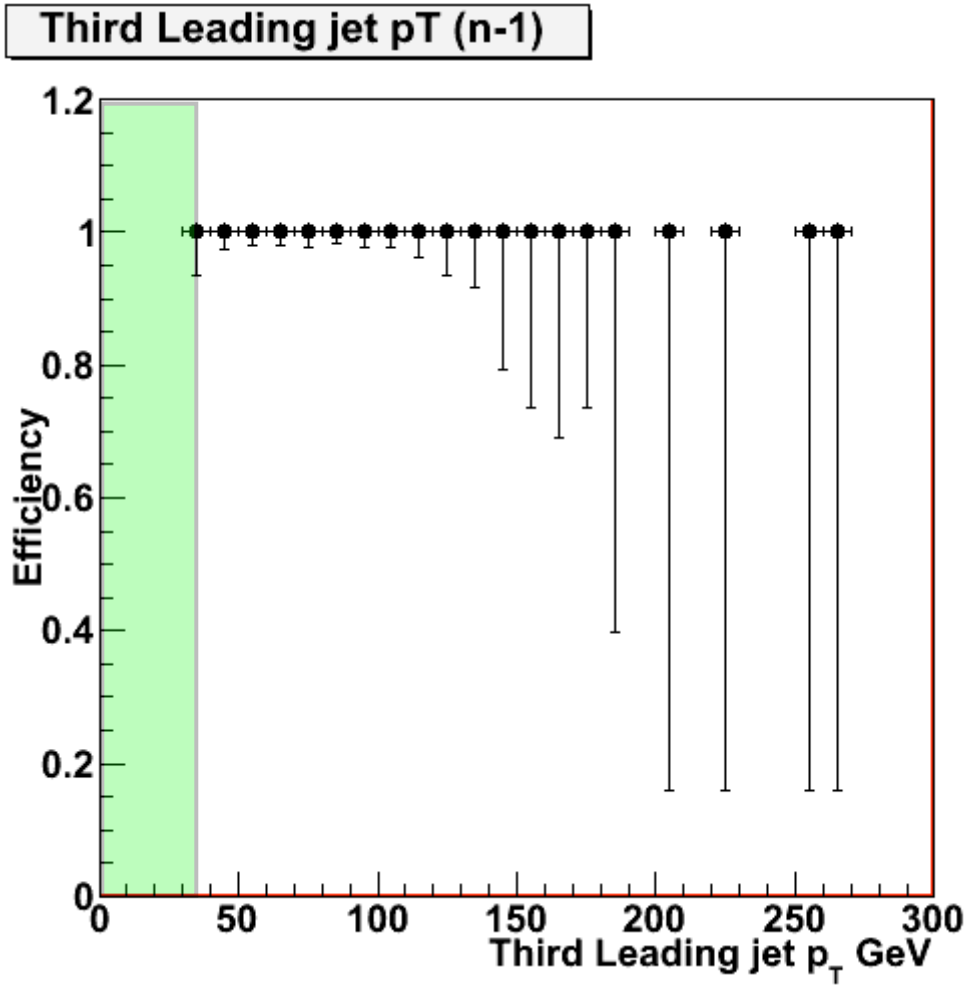
Excluded by our selection

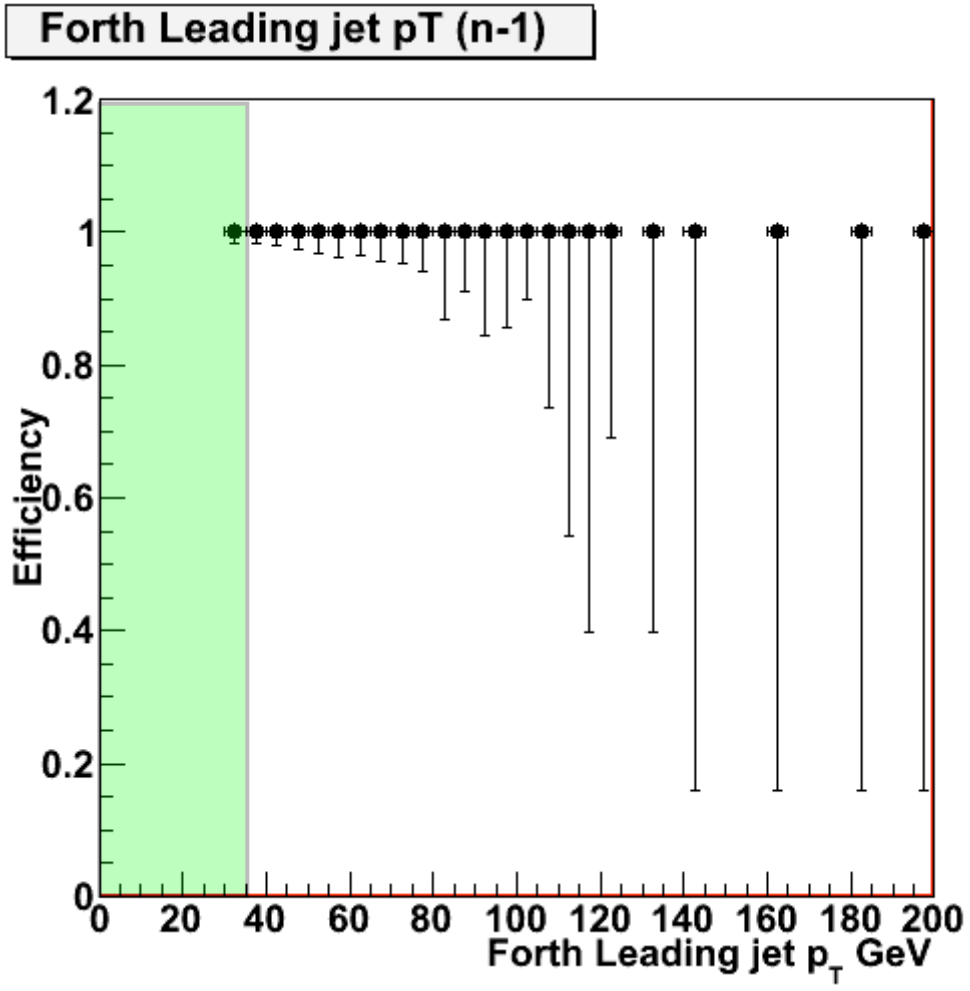
Ele15_HT200


Leading jet pT (n-1)
Efficiency
1.2
1
0.8
0.6
0.4
0.2
0
0
100
200
300
400
500
600
Leading jet p_T GeV


Second Leading jet pT (n-1)
Efficiency
1.2
1
0.8
0.6
0.4
0.2
0
0
50
100
150
200
250
300
350
400
Second Leading jet p_T GeV

Ele15_HT200


Third Leading jet pT (n-1)
Efficiency
Third Leading jet p_T GeV
0
0.2
0.4
0.6
0.8
1
1.2
0
50
100
150
200
250
300

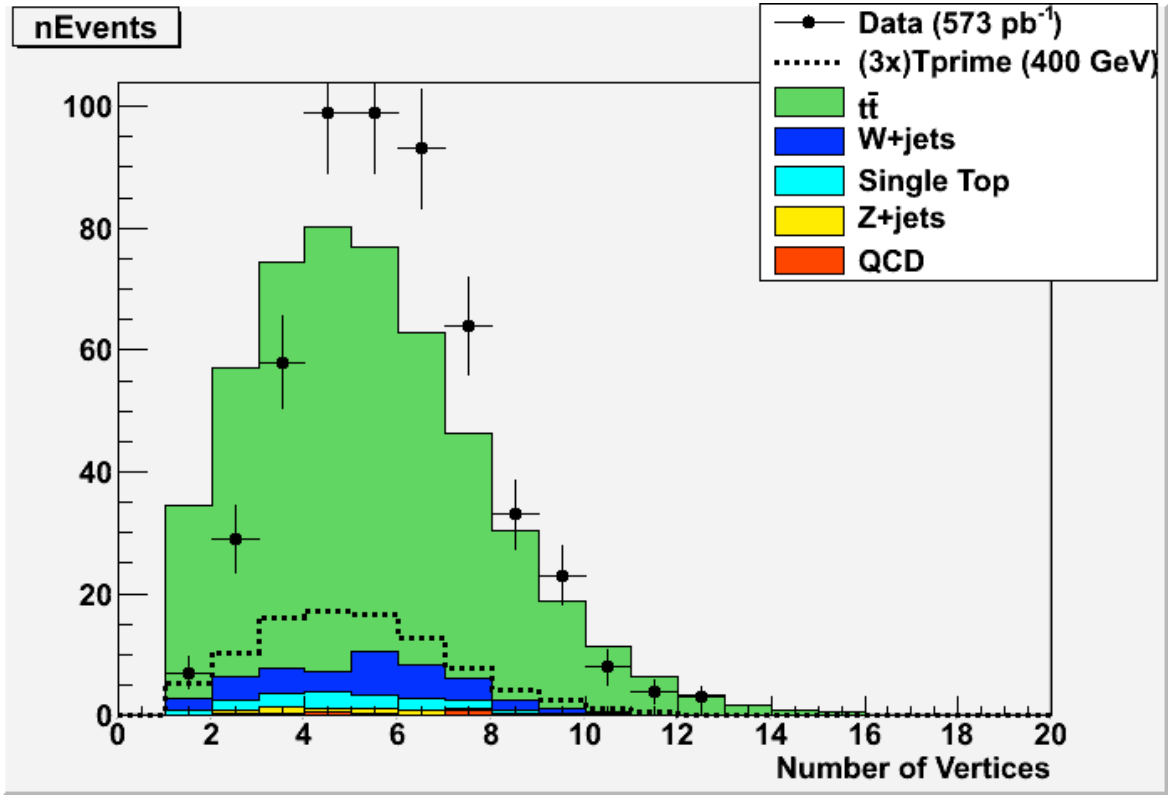

Forth Leading jet pT (n-1)
Efficiency
Forth Leading jet p_T GeV
0
0.2
0.4
0.6
0.8
1
1.2
0
20
40
60
80
100
120
140
160
180
200

Conclusions

- It looks like any of these triggers are fine
- I would still keep the electron pT at 35 GeV
- We have to see how much data each one of them covers
- To study lower electron pTs I am trying to work with a lower pT electron trigger path as control trigger path (in the denominator) but they are so heavily prescaled that we might not be able to do the same kind of study like this one.

Pileup reweighting

- This is what I get



- The muons had a hiccup with their ntuples so we haven't got this distribution yet for summer11